TMC Clearinghouse Development and Initiation

Work Plan

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Objectives

The purpose of this project is to develop, initiate, support, and maintain a central clearinghouse located on the Internet that houses a comprehensive collection of Transportation Management Center (TMC) related resources. The TMC clearinghouse is intended to facilitate the sharing of information among practitioners and the dissemination of innovative tools, processes, problem solving efforts, and capacity building efforts to assist TMC practitioners in performing their duties and achieving the goals and objectives of their respective TMCs. This clearinghouse will allow practitioners to share, exchange, and easily access a wide array of TMC-related resources at a central location. It will also provide a collection of the problems faced, experience, and lessons learned by the existing TMCs to assist practitioners in resolving similar issues.

The project is also intended to assess the staffing, resources, data management, and warehousing needs for the on-going support and maintenance of the clearinghouse. Also included in this task order are the requirements to produce a presentation and a fact sheet to assist with the outreach and awareness related to this project.

The TMC clearinghouse will collect and organize TMC related information and resources that are currently available, to allow the user to quickly find and access the appropriate information. The key activities to be covered in this task order include:

- Develop a central clearinghouse to house a comprehensive collection of TMC resources. This clearinghouse will be located either within the existing Institute of Transportation Engineers (ITE) TMC Committee Web Site (at http://www.tmcite.org) or on a separate server with its own unique address (e.g. http://www.tmcclearinghouse.org);

- Collect and/or provide links to TMC related data and information, including facility and project inventories on TMCs, freeway management systems, traffic management systems, signal control systems, etc.; available resources and literature; current projects and future initiatives; upcoming events; training courses; and software and tools;

- Develop protocols and establish online forums for discussion and information exchange;

- Develop a TMC facility and project inventory database as part of the clearinghouse;

- Develop standardized forms and web-based interfaces to allow agencies to post, modify or update their project and facility information in the inventory database;

- Develop methods and procedures for performing on-going support, maintenance and updates; and

- Identify staffing and resources required to the long-term support and maintenance of the clearinghouse.

Schedule and Staffing

The table below shows the major milestones for each of the six primary tasks. The figure at the end of this document shows a more detail project timeline for the development and initiation of the TMC Clearinghouse.

Task	Estimated Completion Date
A: Kick-Off Meeting and Work Plan	May 30, 2005
B: Collect TMC Resources and Facility Inventory	June 22, 2005
C: Develop Web-Based TMC Clearinghouse	January 30, 2006
D: Testing	March 30, 2006
E: Implementation and Outreach	April 24, 2006
F: Support and Maintenance	April 24, 2006

The primary members of the project team are Gary Thomas, Bradley Hoover, Diana Lin, and Sandra Tucker. Dr. Thomas will be responsible for overall project management, project fact sheet, and initial data collection. Mr. Hoover will be responsible for the design and layout of the web site. Ms. Lin will be in charge of the database design. Ms. Tucker will assist with development of the resources database.

The table below is an estimation of the person-hours for each of the team members by task. This table does not include the estimated time for a data collection person.

Person	Task					
	A	B	C	D	E	F
Gary Thomas	40	60	60	40	74	60
Bradley Hoover	24	40	120	60	42	56
Sandra Tucker	12	70	20	20	0	40
Diana Lin	0	0	90	0	10	0

Task B: Data Collection

As noted in the proposal, this project will not cover a complete data collection effort. Rather, it will collect a reasonable sample of data for each and every category. A TTI staff person will perform this initial sample data collection using existing databases, Internet searches, personal contacts, and agency contacts.

Task C: Clearinghouse Development

Challenges

The primary challenge with any type of web site is how to keep the information contained in the web site current. This is particularly true for information clearinghouses. From a design point of view, clearinghouse sites that are driven by databases are far easier to maintain than those that are written in static HTML code. With all the information stored in a database, it does not take an

expert in HTML coding to keep the web site current. Anyone with some experience in databases and with the proper security privileges can modify the data and have it reflected on the web site.

However, this does nothing to resolve the issue of how to keep the items contained in the databases current. There are a number of different options for data population. The first is to have a person (or persons) dedicated to obtaining the necessary data. While this does simplify things to some degree by not having to rely on others to keep data current, the downside to this is that it would be very difficult to justify having a staff person dedicated to such a task.

Another option is to have others responsible for maintaining their own data. In other words, the manager of a TMC in some state is responsible for keeping his/her facility and project information up to date. They would have an individual log-in and password that would allow them access to only their data. This method creates the need to have perhaps hundreds of log-in identifications and passwords (something that, while not logistically impossible, adds a layer of complexity to the web site that may not be necessary). Further, experience has shown that initially people may enter in their appropriate data, but as time progresses, the information will become more and more outdated as people forget to check their data.

A third option is something of a hybrid of the first two and is the method proposed for this project. Initial data collection could be done to get much of the basic information stored in the database. Subsequently, emails can be sent out to the appropriate contacts to request that they check the data that is applicable to their facility or project. This would be done through simple hot links in the email. If changes are necessary, they can simply reply to the email with the appropriate modifications. The database administrator can then update the data. Theses emails would be generated automatically and sent out at specified intervals (perhaps every 6 months). This is the recommended option.

Database Design

The table on the next page is a draft list of databases and fields to be included in the clearinghouse. Deciding on what fields to include is probably the most critical aspect of the project. While it is tempting to include every possible data element in the design of a database, having too many fields (everything and the kitchen sink) makes it very difficult to maintain. However, having too few fields makes for a database that is not very informative.

The facilities database should contain just enough information as to provide a user with the important information on which to search. For more detailed information on a particular facility, contact information will be made available. Being able to search on "bigger picture" items (such as particular technologies) will help a user narrow down their selections. Links to web facility web sites may further refine their search.

Similarly, the projects database should not become so unwieldy that the information is nearly outdated before it gets entered into the database.

The calendar database will be very simple in design. It will have basic information about when and where an event is taking place with a link to obtain more information.

Potential Databases for Clearinghouse

Facilities Database	**Projects Database**
• Owner • Type of facility (local TOC, regional TMC, statewide TMC, etc.) • Physical address • Primary contact • Contact mailing address • Contact phone • Contact email • Web site link • Facility types covered (freeway, arterial) • Miles covered (by facility type) • Technologies used (cameras, ramp meters, DMS, detection, video monitoring, lane control signals, etc.) • Full time staff • Part time staff • Operating hours • C2C protocol(s) used • C2F protocol(s) used • Date entered • Date last updated	• Owner • Contact name • Contact info (phone, email) • Short description • Long description • Cost • Current status • Web site link • Date entered • Date last updated
Calendar Database	**Resources Database**
• Category (training, event, etc.) • Date(s) of event • Short description • Long description • Contact information • Web site link • Date entered • Date last updated	• Category (web site, journal, article, book, software, tool, best practice, policies, forums, etc.) • Sub-category (?) • Short description • Author/responsible party • Date of publication • Web link (if applicable) • Date entered • Date last updated • Other fields applicable to specific topics (e.g. best practices, software, forums)

The resources database is more complex because of the various subcategories. In the context of this web site, "resources" is somewhat of a generic term. A resource can be an article, book, or web site. It also can include other non-traditional resources such as software, best practices,

forums, and policies. Each subcategory will have its own database fields that may not be applicable to others.

TTI will use Oracle® for all databases. Oracle® is a popular and versatile database that is used by many industry leading companies throughout the world. Should the web site eventually be maintained by an organization that does not have an Oracle® license, all data can be easily exported to a format that can be imported by whatever database software that the organization chooses to employ. Subsequent changes to the web site will be limited to a few lines of code that serve as the interface between the HTML coding and the database access coding, as well as any Oracle specific changes that would have to be made.

Data Updating

After deciding what data elements to include, the most important decision becomes: how does the data stay current? The method used is different for the various databases.

For the facilities and project databases, we are proposing to use automated emails to remind contacts to check for the validity of their facility and project data. Periodically (say every 6 months) the person listed as the contact for a particular facility (or project) would receive an email with a link to their facility/project data. They would then have the opportunity to notify the database manager of any information that has changed. This means that the site will not need to maintain a unique log-in/password functionality. Email messages that get returned as "not deliverable" would initiate a manual process to determine the new appropriate contact.

For the calendar and resources databases, there are a couple of ways of keeping the data current. One will come through the email list. The database administrator should be subscribed to the email list. As members of the list post information about events and resources, the database administrator can add that information to the web site database. Another method that has proven successful is to convene a panel of experts to make recommendations as to content. This method is currently being used to maintain resource information for the Travel Model Improvement Program (TMIP) clearinghouse (http://tmip.fhwa.dot.gov). The panel periodically looks through the existing content to check for outdated documents. They also recommend new documents to be added to the clearinghouse.

Web Site Design

The TMC web site will consist of a public portion and an authorized user portion. The public side is freely accessible to everyone in the public and contains the entire search and browse capabilities for TMC information. The authorized user portion of the site will be used by the webmasters and those who maintain the web site. This section will be used to update the content throughout the web site.

Public Portion

The public portion of the site will contain the search and browse capabilities for the site. This includes information on resources, forums, discussion groups, literature, facilities, projects, training, events and software information. There will also be sections that allow you to contact the webmaster for the site. The final section of the public portion of the website will allow

visitors to sign up for a Listserv® that will be used as a tool for discussion and information exchange.

Authorized User Portion

The authorized user portion of the web site will contain all of the data entry pages for maintaining the aforementioned content for the public portion of the web site. Based on past experience, we recommend that TTI be responsible for regular maintenance of the information, which will include a timely process for requesting, periodic follow-up and entry of all TMC information stored in the database. Insuring that all content is kept up-to-date content is critical to success of any web site. This section of the web site will also contain a place for generating a quarterly status report to be distributed to TMC contacts and other members within the TMC community.

Navigation

The list below shows the main navigational elements (bold print), their purpose, and their secondary navigational elements. This navigation may change as development of the web site progresses.

- Home: Welcome Message
  - FAQ's: A helpful list of FAQ's
  - About TMC: Description/Purpose of site
  - Contact Us: Page for submitting e-mail to the webmaster
- Search: A search page for finding information about TMCs
  - Basic Search: Keyword Search (default)
  - Advanced Search: A more stringent search
- Browse: A listing page to be used for listing various pieces of information.
  - Facilities: A listing of facilities organized by state
  - Projects: A listing of current and completed TMC projects
  - Calendar: A listing of upcoming training courses and other TMC-related events
  - Resources
    - Documents: A listing of documents and reports related to TMCs
    - Software: A listing of software available
    - Best Practices: A database of best practices
    - Forums: A listing of forums discussing TMC information
- Login: The login page to be used by the webmasters/maintainers
- Contact Us: A form for contacting the webmasters/maintainers

Automated Tasks

The system will include a set of regularly scheduled automated tasks that produce e-mail to center contacts which inquire about updates to center contact/location information, upcoming events or training courses. The system may also include a way of automatically generating the quarterly status reports for electronic distribution to the TMC community that have signed up for the Listserv®.

Technology

The system will use PHP as the primary programming language and Oracle® for the database portion of the website. The system will also use a database abstraction layer so that the site can be easily ported, with minimal coding changes, to a host that does not use an Oracle® database server.

Task D: Testing

Each graphical browser like Netscape, Internet Explorer, and Firefox reads code slightly differently. As such, it is important to verify the code of web pages and applications on different browsers to see if results are acceptable. Different screen resolutions also make the pages look different. The intent of this testing is to examine the clearinghouse elements to see if it is accomplishing its objectives, if it is implemented correctly, and its domain information is correct and up-to-date. The goal of this evaluation is to identify problem areas.

TTI shall develop a test plan that describes a detailed approach for testing each of the project objectives and clearinghouse elements. The test plan shall identify, at a minimum, the following aspects to complete the test:

- Overview of the clearinghouse, the objectives of the test, and an overview of the quality assurance strategy.
- Scope and objectives: approach, testing scope, testing process, and test entrance/exit criteria.
- Testing schedule
- Resources: human, software, and hardware resources required. Computer platforms, operating systems, and web browsers and versions to be used for testing should be specified.
- Roles and responsibility: management team, testing team, testing support team, and external support.
- Error management
- Reviewing and status reporting
- Approvals

TTI shall conduct testing in accordance with the final Test Plan. At the conclusion of the test, TTI shall provide a report along with a checklist to summarize the testing results. The report should summarize tests performed, problems encountered and possible causes, resolutions to the problems, and a complete testing result. The checklist accompanies the report shall indicate testing environments, components, features and functions tested, and the results of such tests in terms of pass or fail.

Task E: Implementation and Outreach

TTI is currently exploring the use of webcasting technology to deliver live seminars on the Internet. It is proposed to use this technique to formally launch the availability of the new TMC clearinghouse web site. The webcast providers being considered all have the ability to demonstrate applications remotely.

Task F: Support and Maintenance

On-going, day-to-day support and maintenance is essential to the successful operation and usefulness of the clearinghouse. TTI shall identify, develop, and document the methods and procedures for on-going support, updates, and maintenance of the clearinghouse. A manual shall be developed to provide step-by-step guide to assist web administrator(s), the TMC PFS support contractor, and other authorized users in performing day-to-day operation and maintenance of the clearinghouse.

TTI shall develop and document a plan, strategies, and tools for long-term operation, maintenance, and enhancement of the TMC Clearinghouse. Within this plan, TTI shall also identify and assess the future staffing, resources, and data management and warehousing needs to support the long-term operation, support, and maintenance of the TMC Clearinghouse.